



Multimedia Solutions in a Problem-Based Learning Curriculum

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Problem-based learning (PBL) has been utilized as the primary mode of curriculum delivery at the John A. Burns School of Medicine since 1989. Its use has been evolving to best fit the needs of the students. Some of the benefits of PBL include fostering self-directed and life long learning skills, teaching a broad spectrum of topics in the context of actual patient cases, and promoting the integration and application of knowledge. Despite the successes with PBL there are barriers to maximize the benefits of a PBL curriculum, especially in the clinical years. These barriers are being addressed by encouraging more discussion of psychosocial issues and mitigating the geographic challenges in the clinical years, through the use of multi-media.

Preclinical Uses

In the first two years of the curriculum at JABSOM, students are exposed to physician-patient encounters in various educational settings. The centerpiece of curricular content delivery in this PBL school is the healthcare problem (HCP), the primary method of introducing the physician-patient relationship. For first and second year medical students, the HCP is typically a paper-based patient scenario. In addition, a few cases incorporate standardized patients (actors playing the role of the patient who was introduced in the HCP.) Students meet twice per week, each for three-hour sessions. Under the guidance of a faculty tutor, students proceed sequentially through each paper case. Problems are identified, patient diagnoses are hypothesized, and learning issues that need further study are identified. Because students define their learning content, course directors are challenged to create cases that inspire students to select topics emphasized on the syllabus. To supplement the paper HCPs, students participate in clinical skills sessions that focus primarily on physical examination skills with actual patients, or with each other, under the supervision of a practicing physician. Students experience 'real' physician-patient encounters. For a detailed account of the JABSOM PBL curriculum, please refer to Kasuya et. al¹.

A major strength of PBL is the placement of the medical school curriculum within the context of the patient, thus giving relevance and cohesion to the vast amounts of medical facts and principles students must learn. This context motivates learning and possibly enhances retention². A difficulty that students experience is in discussing and learning psychosocial issues related to the HCP under study. To engage students more, a multimedia HCP has been adopted

and adapted for the curriculum. This HCP, created by faculty at the University of Colorado School of Medicine, features video and audio clips of physician-patient interviews, consultant interviews, physical exam maneuvers, text, and a user-selectable laboratory exam results menu. This case has been adopted by five other schools of medicine for use in their curriculum³.

All second year students progressed through the multimedia HCP. The format generated much discussion on the psychosocial aspects of the case. The students also enjoyed the physical exam video clips, and provided feedback that included comments such as "the visual aspects of the case makes it more real and memorable." Incorporating multimedia into JABSOM PBL has the potential to further the depth of student engagement in the patient's "experience", and may further stimulate learning and knowledge retention during the "preclinical" years of medical school. Plans are underway to investigate further the impact of multimedia on PBL. Additional multimedia solutions implemented at JABSOM in the preclinical setting have been previously described, and include an experimental immersive virtual reality patient encounter⁴, and webpage access to static images⁵.

Clerkship Uses

Two major challenges of continuing PBL in the clinical clerkships are time and geography. Clinical disciplines struggle to fit in enough patient care experiences, didactics, and conferences into the students' rotations since there is often limited time for additional PBL group experiences. The Medicine clerkship has implemented on-line case presentations, some of which include use of multimedia. These cases are not structured as PBL, but exploit the advantages of the Web to address the difficulties of limited time in the clerkship. These cases can supplement full hands-on clinical electives.

In the Family Medicine clerkship, a significant barrier is that students are placed with community preceptors located throughout the state, including rural Oahu and the neighbor islands. This makes it difficult for students to meet on a regular basis for PBL groups. To address these problems, a series of web-based PBL cases have been created so that the students can complete assignments on-line throughout their clerkship, at their own individual pace.

Presented to the students are patient cases very similar to the HCPs that they work with in the pre-clinical years. Students go through the same steps in the PBL process on-line and are required

to come up with hypotheses and to explain their reasoning. They are expected to be able to adjust their differential diagnosis list as the case unfolds and as they obtain more information. Students must also list items that they feel would be relevant to access from the patient history, physical exam, and diagnostic studies and to explain why the items would be important, prior to providing this information during the web-cases. Students are provided the opportunity to ask a variety of history questions, examine all parts of the physical exam, and choose from a number of diagnostic studies for each of the patient cases. They are instructed to select only those that they think will be pertinent to that particular patient case. Their choices are recorded electronically and reviewed for patient relevance. In addition to the basic steps of PBL, the students are also asked various questions throughout the case to stimulate learning issues. They are encouraged to come up with their own learning issues based on the information presented. Students are encouraged to research these areas while they are doing the cases from web-based resources provided for each case.

The web-cases allow the Family Medicine clerkship to provide a standardized curriculum to their students and encourage the continuation of the principles of PBL. Students complete the cases on their own time which allows for more clinical time with their preceptors and encourages the exploration of web-based medical resources, a part of the medical informatics curriculum for the Family Medicine clerkship. The web-cases have received excellent feedback from students and facilitates their use of the principles of PBL in their daily routine of patient-care in the outpatient setting.

Conclusion and Future Direction

Effective use of multimedia has helped to maximize the benefits of PBL that includes addressing issues of culture (psychosocial discussion is not part of the culture of medical students), limitations in time, and geographical barriers. The new medical school campus in Kaka'ako also holds new promise for expanding the use of multimedia for students with the inclusion of intranet with web-based learning materials, increased use of multimedia in the HCPs for the first two years of the curriculum, and the extensive numbers of web-cases and online lectures. Although multimedia solutions will never replace the need for face to face PBL sessions, they will play a key role in optimizing their effectiveness for JABSOM' students.

References

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is always a danger in diagnosis and therefore a list of differential diagnoses is imperative to prevent diagnostic tunnel vision. We deal with unmanageable masses of information by pigeon-holing, by profiling, by stereotyping. The trick is not to let that blind us to the nuances of disease and diversity of patients. But without these sorting techniques we could never make a diagnosis.

Finally, I must point out that the book devotes a great amount of print to percentages and statistical profiles of various groups while at the same time explaining that no group is homogeneous. This makes for difficult, boring reading which can not possibly be assimilated. One might use the book as a reference if faced with one of the groups discussed, assuming you had no first hand information. Even if you do have first-hand knowledge it might be useful, since our experiential information is never complete or objective. The same criticism applies to the sections dealing with various religious and spiritual beliefs and practices affecting medical care. Indeed, as is pointed out over and over, this volume is only a small sampling covering only a tiny fraction of the cultures and ethnicities of this world. For example, Chapter 5 deals with care of "Asian-Americans." This subject alone deserves at least an encyclopedia.

A problem which is just touched upon is the small numbers of physicians (and other health care personnel) who come from many of the types of groups discussed in the book. Correcting this is desirable of course, but probably it has to solve itself over time in view of the economic, educational, and cultural hurdles. In fact my own view is that education, whether it be in language, health concepts, scientific method, or whatever, is essential for the populace as a whole and is the only feasible answer to the dilemmas posed in this book. Nevertheless, it is the mandate and requirement of all physicians to do what they are capable of doing in the setting in which they find themselves. It is unrealistic to expect any one individual to be competent in every culture with which he/she may have to deal. The solutions must come from the entire society, and most importantly from those members of the society that are underserved. Political will, economic resources, and above all education are essential. The job is not one which physicians or the medical profession alone can solve. This book points out what the problems are and urges the medical profession to contribute. As it has been famously said in another context "it is hard work," and by its very nature, I might add, will never be finished.

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